When Size Matters
One metre forward, one foot back

David Rance

My childhood

I grew up in a pre-decimal imperial weights and measures world. During my childhood in the UK I knew no better than that there were 12 pennies in a shilling and 20 shillings in a pound sterling. Anything weighed was in pounds and stones or even hundredweights. Distances could be in yards, chains, furlongs or miles. For calculating in such units a *Ready Reckoner* or *Barème* was more useful than a slide rule [1]. However, I and many fellow "baby boomers" now find it difficult to remember the era when shopkeepers and office workers had to do everyday transactions in what for anyone outside the United States (US), Myanmar and Liberia would now consider strange and irrational imperial units. For example:

- In an ironmonger's how much would it cost[1] for:

  1¼ pounds of 2 inch wrought iron nails @ penny ha'penny (1½ pence) an ounce?
- In the chancery of a wealthy landowner what is the annual rent[2] due on a plot of land:

  1 furlong by 2½ chains @ 30 pounds sterling an acre?

Example page out of a Ready Reckoner that was only ever a printed calculating aid

A few slide rule makers designed pre-decimal currency scales and some innovative imperial based scales but the majority could only compete with a Ready Reckoner by putting a ubiquitous table of constants or a list of imperial to metric conversion factors on the back of their slide rules.

Unusual sizes

Nowadays I only know my height and weight in metric. But oddly some other physical traits I intuitively still only know in the imperial units from my youth - for example, my hat size is **7½**. Part of why I remember such a quirky size maybe a lack of everyday use. How often does anyone need to buy a hat, a pair of gloves or even a pair of shoes?

For shoes the strange imperial **0-13** scale is inconceivably based on the length of a barleycorn and comes from the Romans [2]. Later, thanks to Frenchman, Xavier Jouvin (1801-1844), we got the similarly strange **4-10** imperial scale for glove sizes. At least Xavier's unusual sizing scale was based on measuring the hand around its widest part, the knuckles [3, 4]. I rarely buy gloves but insisting on my "correct size" seems superfluous as holding them up against an outstretched hand is enough. When buying shoes it helps to limit the pairs to try on by going for your "theoretical shoe size". But I often find the style and/or maker means I need a half-size bigger or smaller than my theoretical shoe size. However, when it comes to finding the right-sized hat, the margins are more critical. Wearing a hat that is too tight can literally be a headache. Whereas if it is too loose, the hat will slip down and end up resting on

Glove gauge in use

---

[1] Answer = 2s 6d or half-a-crown.
[2] Answer = £75 0s 0d or 75 quid.

the ears for an unflattering "Freddie 'Parrot face' Davies"[3] look and get quickly blown off whenever out in a gale.

So if the cap fits …

… wear it but only if it is the right size. However, part of the complexities of constructing a hat is making sure it is a good fit. Heads are not round and no two have the same contour. In the past, for made-to-measure formal headwear such as a top hat, a Hatter used a device that looked more like an instrument of torture: a **conformature**.

Conformature in the Hat Works Museum of Hatting [5]

Conceived in the 18th century, the multiple mechanical measuring points inside the conformature produced an exact mould or template of an individual's head. Later as headwear became less formal and the rag trade embraced "ready-to-wear" tailoring, a standardised imperial **5-9** scale for hat sizes came into use so buyers of hats knew the size they needed to look for.

The hat scale is subdivided into ⅛ inch divisions or size steps. However, as no head is perfectly round nor is any hat perfectly round. So the shape of any hat is more of an oval. Consequently to size a hat correctly two measurements are taken

and one being modelled

1. from the front "**12 o'clock**" position inside the rim, measure the distance to the back "**6 o'clock**" position
2. from the side "**9 o'clock**" position inside the rim, measure the distance across to the other side or "**3 o'clock**" position

The average of the two measurements, rounded up to the nearest ⅛ inch, gives the imperial hat size traditionally put on the makers label in a hat. To simplify taking such measurements a special Hatter's or Milliner's sizing rule or gauge was developed. This 5 inch tool is deceivingly simple to use but is highly effective for hat sizing and many are still in use.

---

[3] Popular UK comedian from the 1970s/80s who wore a trademark black Homburg hat pulled down so low it ended up on top of his squashed ears.

Three different Hat Rules or Gauges from my collection with their slides extended

All the examples shown have a central slide that extends in one direction so measurements of up to 9 inches can be taken. The first unmarked bevelled edged ivory example with nickel silver end braces and button is most likely the earliest. It was probably made in continental Europe as the scales are unusually calibrated in both inches and centimetres – labelled on the slide as "FRENCH" and "ENG.". The middle late 19th century boxwood example with brass end braces and button has the name *W. Booth & Co Manchester* stamped into the bottom side edge. Surprisingly the company provenance is of a Grenfell based Australian General Drapers, Tailors and Outfitters [6]. The last early 20th century boxwood example with brass end braces, slide and button has the name *Clements Newling & Co Ltd London* stamped into the bottom side edge. In its day this popular UK supplier to Drapers was a known reseller of items by tool maker *John Rabone & Sons* [4]. So this example is most likely a rebadged Rabone No. 1464 Hat Gauge [7]. On the back of the latter two examples is a 3-column relationship table in inches that is typically found on most Hat rules. The column labelled "**SIZ**" is the hat size according to a truncated version of the **5-9** hat scale, the column labelled "**HEA**" is the corresponding circumference of the head and the column labelled "**HAT**" is the corresponding circumference of the hat [4]. This table comes in handy when somebody does not know their standard hat size. With a flexible tapeline measure the circumference of the head in inches from a point in the middle of the forehead above the eyebrows and above the line of the ears. Using the relationship table look up the measured circumference in the **HEA** column and the equivalent standard hat size can be simply found in the adjacent **SIZ** column.

Many people have no idea what their hat size is in imperial or metric. This combined with traders striving to simplify the online buying experience (and limit the number of returns) by reducing the number of sizing options means universal sizing charts are becoming increasingly popular.

SIZ	HEA	HAT
$5\frac{7}{8}$	$18\frac{1}{2}$	$19\frac{3}{8}$
6	$18\frac{7}{8}$	$19\frac{7}{8}$
$6\frac{1}{8}$	$19\frac{1}{4}$	$20\frac{1}{4}$
$6\frac{1}{4}$	$19\frac{5}{8}$	$20\frac{3}{4}$
$6\frac{3}{8}$	20	21
$6\frac{1}{2}$	$20\frac{4}{8}$	$21\frac{1}{2}$
$6\frac{5}{8}$	$20\frac{7}{8}$	22
$6\frac{3}{4}$	$21\frac{1}{4}$	$22\frac{3}{8}$
$6\frac{7}{8}$	$21\frac{5}{8}$	$22\frac{7}{8}$
7	22	$23\frac{1}{8}$
$7\frac{1}{8}$	$22\frac{3}{8}$	$23\frac{1}{2}$
$7\frac{1}{4}$	$22\frac{3}{4}$	24
$7\frac{3}{8}$	$23\frac{1}{4}$	$24\frac{1}{2}$
$7\frac{1}{2}$	$23\frac{5}{8}$	$24\frac{7}{8}$
$7\frac{5}{8}$	24	$25\frac{1}{4}$
$7\frac{3}{4}$	$24\frac{3}{8}$	$25\frac{5}{8}$

EU size (cm)	53	54	55	56	57	58	59	60	61	62	63	64	65
US size	$6^{5/8}$	$6^{3/4}$	$6^{7/8}$	7	$7^{1/8}$	$7^{1/4}$	$7^{3/8}$	$7^{1/2}$	$7^{5/8}$	$7^{3/4}$	$7^{7/8}$	8	$8^{1/8}$
UK size	$6^{1/2}$	$6^{5/8}$	$6^{3/4}$	$6^{7/8}$	7	$7^{1/8}$	$7^{1/4}$	$7^{3/8}$	$7^{1/2}$	$7^{5/8}$	$7^{3/4}$	$7^{7/8}$	8
Inches	$20^{7/8}$	$21^{1/4}$	$21^{5/8}$	22	$22^{1/2}$	$22^{7/8}$	$23^{1/4}$	$23^{5/8}$	24	$24^{1/2}$	$24^{7/8}$	$25^{1/4}$	$25^{5/8}$
Men's Hats	Small				Medium			Large		X-Large		XX-Large	
Women's Hats	Small				Medium		Large						
		S/M			M/L								

Universal sizing chart with hat sizes listed in metric, imperial and popular clothes sizes

The extra "US size" row is common in such charts but the consistent ⅛ inch inflated increase (also added into the "Inches" row) over the standard values in the "UK size" row is largely inexplicable. Imperial units are still used in the US. So unlike countries working in "EU size (cm)" that might be baffled by the traditional imperial UK hat sizes, such units should be familiar in the US. One plausible explanation for the different calibration could be the US penchant for liking everything a tad bigger!

Get a hat (rule)

Hat sizing rules or gauges are often wrongly catalogued or mistaken for button gauges or even pocket slide rules. For Hatters and modern-day Milliners they are still a handy and convenient measuring aid. For collectors these tactile beauties are worth looking out for as they stem from a bygone age when a hat such as a bowler or a top hat was a "must have" everyday clothing accessory.

Acknowledgements and References

[1] **Rance**: *Reckon on it! A very British trait*, Proceedings IM2009, Greifswald, Germany, 2009.
[2] **Shoe Fashion**: *The Interesting History of Shoe Sizes*, website
 https://didyouknowfashion.com/the-interesting-history-of-shoe-sizes/ .
[3] **The Glove Website**: *How to make gloves*, website http://www.glove.org/default.php .
[4] **Jane Rees and Mark Rees**: *The RULE BOOK Measuring for the Trades*, ISBN 13: 978-1-931626-26-2,
The Astragal Press, USA, 2010.
[5] **Hat Works Museum of Hatting**: *Stockport*, UK, website https://www.stockport.gov.uk/topic/hat-works .
[6] **TROVE Digitised Newspapers**: *William Booth & Co. advertisement*, National Library of Australia, website
https://trove.nla.gov.au/newspaper/article/130957180 .
[7] **Kenneth D Roberts/John Rabone & Sons**: *"Reprint of John Rabone & Sons 1892 Catalogue of Rules,
Tapes, Spirit Levels"*, K. Roberts Publishing Company, ISBN 0-913602-49-3, 1982.